



ORIGINS

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in this issue:

Questions of Quanta

The Gospel and Genesis

**The Second European
Creationist Congress**

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Writing for Origins

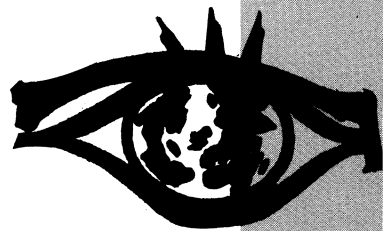
Origins is looking for talented new writers, particularly those who have expertise in a specialized field of science or theology, in relation to creation, and who are in sympathy with the aims and basis of the B.C.S. In addition writers in a popular vein are needed, but accuracy and solid content are still essential. Any manuscripts for consideration should ideally be typed, double-spaced and sent to the Editor. News items that may be of interest are also sought.

Editorial Policy

While 'Origins' exists to further the aims of the Biblical Creation Society, opinions expressed in articles and signed editorials are not necessarily shared by either the Editorial Committee or the Society.

Credits

Design, illustration and artwork by Steve Carroll, Reading.



Editorial

And now for something completely different...

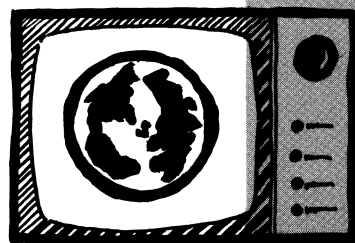
The basis of our Society is in the Word of God; we believe in creation because God has told us that is how all things material began. Our leading article this time is not a scientific, but a 'theological' one, containing many stimulating and thought-provoking suggestions as to the implications of the perfection of God's original creation. This is a thread which runs throughout the Bible, and the creation, and indeed the world to come, echo that original model in many ways. We cannot fully grasp the message of Revelation until we have gleaned the meaning of Genesis.

Nevertheless, the main technical article is again a scientific one. When we talk of origins we are usually dealing with something intangible because it has to do with a unique event in history; but quantum theory is concerned with those things that are intangible because they are so small, and we only know of their existence by necessary inference — with things, in effect, that we can never know the exact location of, as the very act of 'looking at' them causes them to be somewhere different! This paper is a valuable Christian comment in an area which has often been avoided, possibly because of the whole concept of 'uncertainty' associated with it! The nature of matter itself, and its' relationship with the spiritual, is surely a subject of intense interest to us.

'Origins' 1:1 was well received, but clearly there is room for improvement, and we have implemented a few small changes in this issue. Please continue to let us know if you have any positive suggestions — and criticisms. There are many areas of debate amongst those who believe implicitly in the biblical account of creation, not the least of which is the question of the age of the earth. It is planned to devote one issue next year to this problem, in the hope that those who differ can at least understand the position of their brethren, and even move forward to greater light. We would particularly value for publication any original work in this area, whether scientific or theological. Just what principles and doctrines are at stake?

We would also draw your attention to the report of the Second European Creationist Congress. Reports can merely be a timetable, but this one reveals the width both of interest across Europe, and subjects tackled. Such interchange of ideas across language and cultural barriers is very beneficial — and we would be pleased to receive English versions of worthwhile articles appearing in other languages, providing that the publishers have agreed to possible re-appearance.

M. G. Matthews.

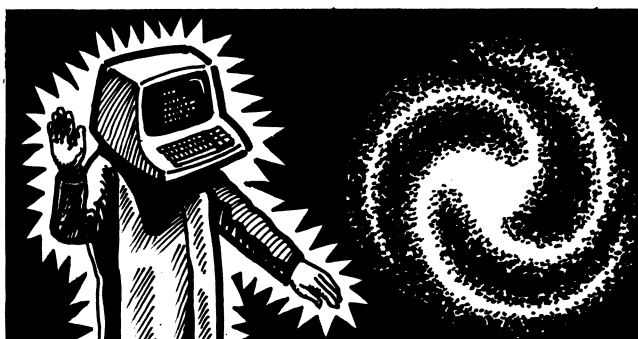


Creation in the News

Co-incidentally with the appearance of 'Origins' 1:1 a correspondence began in the pages of 'Computing' regarding the ability of computers to think and express emotions. Is man just a machine? A number of Christians have contributed to this debate, and a brief letter mentioning 'Origins' elicited a large response from Christian readers. Perhaps a letter mentioning the existence of the Society and its magazine to your own professional journal would be worthwhile? There are always current issues that need Christian comment.

The American Supreme Court has now reached a decision concerning the teaching of origins in State Schools: and it has decided against the teaching of creation alongside evolution. Such a situation is not likely to arise in this country, where evolution is almost enshrined in the system. Sadly, when reporting this decision, the radio programme S04 did not ask for any creationist comment from this side of the water, but instead interviewed Prof. Ayala from the U.S.A, who claimed that 'Christian Science is a sham', and that 'evolution is clearly the central theory in biology'. He also claimed that 'evolution is not anti-religious. It is possible to believe in creation and evolution'. The presenter, Peter Evans, added that 'evolution is written in the rocks; digging up the past is one of the most powerful arguments against creation'. The BCS exists in part to expose the fallacy behind such statements, and articles dealing with these issues are welcomed.

Following our article on the Cosmos, there was an interesting feature in another S04 programme in July. From his calculation of the mass of the universe, one scientist says that the universe is not so old as had been thought, by a few billion years. Thus the sun is a 'medium to old age' star, rather than a 'young' star. 'It puts us in a different relationship to the universe philosophically', he commented. Indeed it does! This theory would seem to coincide with that put forward by Dr. J. Melnick and his colleagues at the European Southern Observatory in Chile, (according to a report in the Times, May 4th 1987). Their measurements seem to imply a value for Hubble's constant which gives a much younger universe than generally accepted; but this then conflicts with other theories. Apparently Dr. Melnick is 'confident that the Big Bang will certainly fall before too long'.



The Catalytic Effect Upon the Gospel of Genesis

D.M. Gilpin-Brown

The significance of the truth or otherwise of Genesis chapter 1 in particular, and the remaining early chapters in general, lies in the effect which it has upon the gospel we preach. If Genesis One is true, if we believe in that truth, appreciating and applying the revelations which it contains, and if we begin our understanding of the Gospel of God at that vital point at which He Himself begins His revelation of it, then we will find that gospel immeasurably enriched, particularly in its application to all contemporary need — including violence, poverty, environmental issues and 'women's lib'. Only a complete Bible gives us a complete and totally relevant gospel. If, therefore, we presume for the moment that Genesis One is true, and if we also begin at the beginning and follow through to the end, we can trace the history which results in various stages summed up in 1 Peter 1 : 20. 'Christ...chosen before the foundation of the world'.

A. Creation

The foundation of the physical realm was characterised by life, by health and abundance; by full provision for all — an interdependence of 'unalikes', of dissimilar creatures and entities, requiring full contributions from all. There was a total inclusiveness, a dependence upon the sovereignty of God, upon the life of God, relayed via the caretaking role of man. All was characterised by excellence. All these need to be borne in mind as we travel further.

B. Cosmic Catastrophe

The three human relationships of Genesis One which are stated or implied in v.28, (with one another, with the environment and with the Creator), are destroyed or distorted. (2:8,9, 1:17-10b) But that was not all. Heb. 9:23 implies that the effect of the Fall was so great that even 'the heavens' were in need of cleansing. What we call 'The Fall' was, therefore, a cosmic catastrophe of incredible proportions, involving not only every subsequent generation of people, as outlined in Romans 5, but literally everything else pertaining to life on earth. "Cursed is the ground because of you", says God in 3:17. He was surely stating a logical fact. Man had stepped out of line, and the flow of life from God to **all forms of life** was therefore cut off. Death, disease, destruction, deception, division, insufficiency, defeat and disasters become the new 'norm'. Whilst we may still ask why God allowed evil in the first place, we need look no further than this appalling catastrophe for the origin of **all** that plagues us. This can only be fully appreciated when contrasted with the excellence of Genesis One, a contrast which also shows us the full meaning of Romans 3:23, 'all have sinned and come short of the glory of God.' Whilst many have an experience which spiritually convicts them of the truth of this, none of us need look further than the excellence which characterised God's creation to realise how far we have fallen **in every area of our existence**.

C. Reconciliation Prepared and Portrayed

We know from passages in Romans and Hebrews that the Old Testament is more than history, or rather, that the characters and incidents recorded had deep significance with regard to the reconciliation which was being prepared. They depicted spiritual truths which would

one day help us to understand both God's great Act of Reconciliation and also how to appropriate the benefits of it. But there are two aspects to this which are often missed.

The first is that reconciliation is based on victory over the enemy who caused the original catastrophe. Gen.3:14,15 is often referred to as a promise to Adam of eventual salvation. True, there is such a promise inherent in the verses, but it is implied only. God is talking to **the enemy** and telling **him** of eventual defeat, a defeat which was totally effected by Christ on Calvary — a defeat which we sometimes fail to see the need of and of which we too seldom take advantage. (1 John 3:8; John 19:30; Col. 2:15).

The second thing which seems often to be missed, as we study God's preparations for and portrayal of His coming act of reconciliation, **is that the church at Jerusalem, as depicted in the early chapters of Acts, was what resulted from those preparations and must therefore be the type of 'church' which He wanted.**

D. Reconciliation Achieved

"He died", says the old hymn, "that we might be forgiven,.....saved by His precious blood." Yes, Jesus came into the world to save sinners. But it was God the Father who sent Him; God the Father who achieved the great act of reconciliation through Jesus; God the Father with whom we are reconciled and to whom we now have access. We should be entering through Jesus into the new life of intimacy with the Father, which is what He wants and for which He prepared for so many centuries. A reconciliation which renews the companionship known in Eden, but which is enriched by the fact that those who worship Him through Jesus have a far better knowledge of His whole nature, of His worthiness to be worshipped, than Adam or Eve would or could ever have known. But we need to look more closely at the reconciliation which God achieved through Christ, by the Cross. "God reconciled us to Himself through Christ", we read in 2 Cor. 5:18. In Colossians 1:20 we read something further about God's reconciliation, something most significant. It is this: "God was pleased... through Him (Christ) **to reconcile to Himself all things**, whether things on earth or things in heaven, by making peace through His blood shed on the cross."

We spoke earlier of the three relationships which had gone awry at The Fall, the spiritual, the social, the environmental. We read here that God **has** (not will) reconciled **ALL THINGS**. All things on earth and all things in Heaven. What does this imply? That, if we begin where God begins, if we follow God's revelation through as God Himself develops it, we finish up with a greater and more glorious gospel than we could ever dream of; a gospel which is totally comprehensive of our need, of our earth's every need and indeed that of every man, be they a Green Peace devotee disturbed over man's destruction of his environment, or a drug addict incapable of lifting a finger to help himself. **GOD HAS PROVIDED A TOTAL RECONCILIATION, A RECONCILIATION WHICH TOTALLY NEGATES THE EFFECTS OF THAT ORIGINAL DISASTROUS COSMIC CATAS-**



TROPHE. We can see it and experience it presently by faith, though inevitably, only in part, but the time is coming when we shall see it and experience it fully, wholly and completely. So we see that the gospel according to Genesis **includes the healing of the world**. If God was indeed to be victorious over the enemy who had caused the original catastrophe, could He do anything less?

E. Reconciliation Experienced and Demonstrated

The first Jewish believers were people who had centuries of teaching behind them, centuries of discipline and suffering and on this ground, prepared by **teaching and discipline** came deep conviction, the indwelling and enduing of the Holy Spirit; and the result was God's revolutionary New Creation, a people who lived differently, loved differently, worshipped differently. A people who demonstrated some of the excellence, abundance, full provision, inter-dependence etc. of God's first creation. This is deeply significant. Genesis One portrays God's standards of workmanship, God's trademarks, and we may, must, use these yardsticks to test that which calls itself God. God's original creation was incredibly economic, producing the maximum results from the minimum input. There was the maximum opportunity and flexibility with the minimum restriction. Given that everything must reproduce 'after his kind' there is opportunity to adapt, and develop. Every apparent 'rule' is broken — fishes fly, birds swim, whales sing, etc. Birds, animals, plants, all turn up in the most unlikely places, such as blitzed sites during and after the war; incredibly healthy-looking foxes inhabiting suburbia, etc; whilst alongside all this is the inter-dependence of **unalikes**. How, why does it all work? Because spiritually it is all held together by the Lord Jesus Christ, (Col 1.17) God meets need through variety. (We meet need through uniformity and fail dismally). The stately beech tree depends for its health upon such unlike things as the wind, rain, sun, worm, fly or bee! Again, God's 'society' is different to our own in that however humble, however limited a creature's 'gift', that gift is equally vital to the support of life. One of the benefits of the early days of the charismatic movement was the discovery of this principle as it applied

to christian fellowship and church worship. And, just as our natural environment is upheld by the presence of the Lord Jesus, so our spiritual environment is upheld by Him working through the Holy Spirit, who, in the matter of gifts and ministries — and their exercise — is sovereign. (1 Cor 12: 4-7,11) and just as it is His presence within that gives us life, so it is His presence within our corporate body which turns it into an organism instead of an organisation.

CONCLUSION. We have seen that, believing in Genesis One and working forward from that point at which God Himself begins His revelation and applying some of the truths which Genesis One contains, we have found that God's act of reconciliation achieved through the Lord Jesus Christ on Calvary is something far greater, more inclusive and comprehensive, more powerful and relevant today, than we had ever previously dreamed. In short, it negates all that the enemy achieved at The Fall (Romans 8:1-3 echoes this also). We have seen how, as we work forward, the first demonstration of His New Creation takes on a tremendous significance. Some of us, seeing afresh the perfection, the Glory of God in creation, and realising that all that falls short in us is sin, will repent afresh and find ways of making restitution — as necessary a part of repentance as the confession of wrong doing.

Genesis One is full of glory, the glory of God. Having seen it one becomes aware of that standard which God wants, because He will never be content with anything less than 'excellence'. One becomes aware of falling short in every area of life, not just those previously of spiritual or theological importance or relevance. If God created the heavens and the earth, there is no corner of life which is unimportant or irrelevant... similarly, there can be no complete healing of relationships, no salvation, if any corner still harbours 'sin', failure, a falling short of that excellence, whether it is personal, or national, past or present.

"In the beginning GOD created the heavens and the earth and God saw that it was excellent" Gen.1:31.

The Second European Creationist Congress

held at the Belgian Bible Institute at Leuven from 20-23 August 1986

The Congress was organised by members of the "Foundation for the Advancement of Studies faithful to the Bible" at Amersfoort in the Netherlands. From its inception in 1974, the Foundation has gone from strength to strength, with the opening of an Evangelical College in 1977 followed by the launching in 1982 of the International Christian University. Full details were reported in the BCS magazine 'Rainbow', No.9.

Of the 70 people attending the Congress, 24 were Dutch. The next largest contingent (18) came from Britain; with smaller groups from Belgium, France, West Germany, Monaco, Sweden, Switzerland, Eire and the USA. Five out of the twelve lecturers were Dutch, most of whom teach at Amersfoort.

One of the first to greet us on our arrival at the Congress was Dr. H. Beck from West Germany. Dr. Beck, who holds doctorates in both engineering and theology, became a creationist in 1978, after having been a theistic evolutionist and leading member of the Karl Heim Gesellschaft. The creationist movement in the Federal Republic owes its existence to Dr. Beck, who founded Wort und Wissen in 1979 and is the movement's leading organiser, lecturer and author.

The acceptance of evolution by many theologians has had disastrous consequences. One of the lecturers, Dr. Verbrugge, told how the liberal theologian's acceptance of theistic evolution had resulted in the de-Christianisation of churches in the Netherlands.

Creationism is not solely a scientific issue; neither is evolutionism. Both these conflicting world-views have philosophical and religious aspects. Some of the lectures dealt with these matters, e.g. the origin of monotheism; and Brian Austin (of 'The Mustard Seed') presented a detailed review of the philosophical background to the communications gap that now exists between the opposing views held by evolutionists and creationists. He traced the development of modern evolutionary thinking from the philosophy of Hegel — with its similarity to the mystic ideas of Taoism where good and evil are seen as equally necessary natural forces; opposite sides of the coin, as it were. The writings of Darwin and Spencer, and of Marx and Freud were shown to be interrelated; they illustrate the fact that evolutionism has infiltrated nearly every field of thought: science, the arts, politics, sociology and psychology.

Mr Austin alerted his audience to the dangers of the New Age Movement, with its promotion of the occult and belief in evolutionary pantheism as the coming world-religion. The movement is insidious and subtle because it often presents itself in association with seemingly harmless pursuits. In conclusion, Mr. Austin said that scientific evidence for catastrophism had forced many evolutionists to abandon the traditional uniformitarian concept.

Dr. W. J. Ouweneel gave the opening lecture, examining philosophical aspects of creationism. This lively lecture generated a good deal of discussion, not to say controversy; I suspect that some of Ouweneel's remarks, such as "There are no objective facts", were made deliberately to startle his hearers out of complacency.

Although he produced a few of his own tongue-twisting 'isms' (such as bibliscientism), he rightly warned of the danger of 'isms' affirming that Christ is more impor-

tant than creationism. This vital point was well made by Dr. Watts in the Chairman's letter of the Biblical Creation Society Jan. 1985.

Dr. Ouweneel said that some evangelicals misuse the word 'science' when they adopt an extremely literal approach to the Bible, and assert that real science is only found in the Bible, thus lapsing into obscurantism. On the other hand, atheists and evolutionists are also wrong in their deification of science and their trust in the autonomy of reason. This echoes the words of Aquinas: "We must be on our guard against giving interpretations of the Bible which are hazardous or opposed to science and so exposing the word of God to the ridicule of unbelievers." But, Ouweneel said, the Bible cannot be proved correct or incorrect by science. He stressed the need for a Christian anthropology to transcend the false dichotomy made between faith and science.

An important point made by Ouweneel was that Christians who are also scientists have still to account scientifically for their conclusions without recourse to a 'God of gaps' type of explanation. This point was ably exemplified by other speakers when they presented the evidence of geology and fossils. Both scientists and theologians were reminded that the Biblical account of the Creation and the Flood were primarily parts of salvation-history; scientific models of these events are of secondary importance.

Five lectures were devoted to strictly scientific matters: geology, palaeontology and ecology. Dr. T. Zoutwelle considered aspects of the geological column. He showed how the geological data could be explained by a Flood model: the evidence of the rapid deposition of sediments from water, mountain-building, and the change in sea levels, he considered better explained by a universal Flood than by conventional geology.

The vexed question of age of the Earth was not dealt with specifically at this Congress but Dr. Zoutwelle suggested that the creation of matter could well have been as long ago as 4 or 5 billion years (as deducted from radiometric methods). However, he would place the creation of life at about 10,000 years ago. There is still a lively debate going on between "old" and "young-earthers"; perhaps the subject will be tackled at the 1988 Congress!

In his usual vigorous style Dr. J. Scheven of Hagen, West Germany, showed in his lecture how unnecessary and implausible were the millions of years so readily invoked by evolutionists. He tackled the big questions that challenge creationists. "If evolution did not occur, how do you explain the orderly sequence of fossils? How will you accommodate in Biblical framework of Earth history, the vast amounts of time inferred (by evolutionists) from the fossil record?"

Dr. Scheven began his answer by directing our attention to 2 Pet. 3:3f, which exposes the 'scoffers' mistake'. If all things have continued as they were from the beginning of creation, there would be no fossils, and the nature of the strata prove catastrophism! The challenging question could be answered scientifically by a consideration of the actual evidence, which has been Scheven's life's work; he is in addition the creator of a 'fossil museum' at Hagen.

Continued on Page 10

Questions of Quanta

Philip Duce

Quantum mechanics is one of the most remarkable achievements in science this century. It is an enormously successful account of the small-scale structure of the world, having the power to make correct predictions of a wide range of phenomena. However, it is the subject of unresolved debate and dispute with regard to its interpretation, even after sixty years of successful use.

"The mystery of quantum world" is the title of a recent book by the physicist Euan Squires (1). This book is one of several popular accounts of quantum theory (QT) and the problems of its interpretation. Squires claims that 'in our endeavour to understand the quantum world, we are led beyond physics, certainly into philosophy, and maybe into cosmology, psychology and theology'. He also says that 'the very foundation of contemporary theoretical physics is mysterious and incomprehensible'.

By and large, Squires' book is to my mind an excellent presentation of the philosophical problems at a popular level. He avoids what can be called the 'gee-whiz' approach to the more bizarre aspects. Here I have attempted to summarize the main points in the book and make some commentary on them from the perspective of belief in the existence of a real, physical world created by the God who has revealed Himself in scripture and in the person of Jesus Christ. I have also assumed a 'realist' philosophy of science (as does Squires and as do most scientists); in doing science one seeks to explain phenomena and understand the truth about the world which really exists.

Revolutions

The development of quantum mechanics brought about three revolutions:-

- 1) it opened up a completely new range of phenomena to which the methods of physics could be applied;
- 2) it caused the apparent breakdown of determinism, which was an inescapable aspect of classical (pre-quantum) physics. Even with complete knowledge of the initial state of a system, the outcome of an experimental measurement is only given as a probability. This led Einstein to claim that 'God does not play dice', and it was suggested that quantum mechanics was incomplete. The idea of 'hidden variables' was developed (see below).
- 3) it challenged the belief, implicit in all science, that there exists an objective reality, a reality that does not depend for its existence on being observed.

Recent experiments have produced results which beautifully confirm the predictions of QT, but which are at variance with what an apparently convincing, common-sense argument would predict about what can happen. Moreover, these results are independent of any specific theory. Such quantum phenomena are not consistent with the type of reality which had previously been assumed to exist.

It should be noted that quantum effects are too small to be noticed on the scale of magnitudes to which we are accustomed in everyday life. The basic parameter of quantum mechanics, Planck's constant, has the value of roughly 10^{-34} in standard units; its smallness is partially responsible for our difficulty in understanding quantum phenomena.

We now turn to a brief description of the essential features of QT, and then consider the problems which follow from them with regard to interpretation.

Quantum theory

The classical description of a particle requires that, at all times, it exists in a particular position. The variation in time of this position is calculated by classical mechanics, which involves the velocity, forces acting etc.

According to quantum mechanics, this is only an approximation, and is replaced by prediction of the time variation of a

quantity from which it is possible to calculate the **probability** of the particle being in a particular place. In general, this probability varies with time and the point in space under consideration.

The uncertainty in position of a particle is related to the uncertainty in its velocity. There is in principle no limit to the accuracy with which either the position or velocity can be fixed, but the price paid for making one more precise is loss of information on the other. This fact is embodied quantitatively in **Heisenberg's uncertainty principle**, which involves the very small Planck's constant.

The uncertainty principle does not put any significant on the measurement of everyday macroscopic objects. This is why classical mechanics is so successful in the macroscopic world (Probes are sent to the moon using classical, Newtonian mechanics). But we should note that measuring apparatus is subject to the uncertainty principle, so it cannot be circumvented; measurement of one quantity to a particular accuracy automatically disturbs the other.

Consider a system where a single particle is acted on by some forces. In classical mechanics the state of the system at any time is specified by the position and velocity of the particle at that time. The subsequent motion is then uniquely determined for all future times by Newton's second law of motion. In QT, the state of the system is specified by a **wavefunction**, which exists at all points of space. This too is uniquely determined at all times, if the initial state is known, by the **Schrödinger equation**. Classical mechanics is a deterministic theory of wavefunctions.

Like ordinary waves, wavefunctions show the property of **interference**. QT successfully incorporates the features of 'wave-particle duality' and the 'quantization' of energy in the form of discrete packets, and enables the calculation of all microscopic phenomena which do not involve relativity.

Any measurement made on a system described by quantum mechanics chooses one of certain possible results, each having a particular probability. The measurement selects part of the wavefunction for the system. This process is known as the **reduction or collapse of the wavefunction**, and is the source of the problems when an interpretation of QT is sought.

The problems

There are aspects of the observed world which seem to be mutually contradictory, at least when we try to interpret them in terms of "normal" pictures of reality. QT predicts such phenomena beautifully, hence its enormous success in physics. This prompts us to ask certain questions. Has the theory merely allowed us to calculate the results of experiments, or does it help us to understand the reality of what is happening? Does it tell us anything about reality before we do the experiment? Is the theory compatible with the existence of such a reality at all?

Some writers have taken the view that the theory is a theory of ensembles. It only tells us what percentage of the measurements on a large number of identical systems gives rise to a particular result. We are told nothing about the result for an individual system. If this is the case, then the problems of the interpretation of quantum theory disappear; they have effectively been ignored, not solved.

But individual systems exist, and the problems arise when they are observed. We could argue that QT says nothing about these problems, but the problems do not go away even if this is the case.

We could take a different approach, and claim that the wavefunction is a measure of our knowledge. This is precisely the role of probability in non-quantum situations. The reduction of the wavefunction is what happens when we make an actual measurement and improve our knowledge.



This view cannot explain the phenomenon of interference. Even if we introduce 'hidden variables' (see below) which contain other information not found in the wavefunction, the need for an interfering wavefunction is not eliminated. Interference actually happens.

So we should try to regard the wavefunction as something that is part of the external reality which we observe. In doing so, we encounter problems.

The wavefunction for a system of many interacting particles depends on the position of all the particles. It is **non-local**; in order to establish its value we need to supply the many positions of the particles in space. The wavefunction itself exists in an abstract, mathematical space of many dimensions which corresponds to all the possible positions of the system of particles. This does not really sound like an object which is part of the real world. Also, there is the matter of the reduction of the wavefunction. The wavefunction changes when a measurement is made, and this change appears to be sudden and discontinuous. It is also very non-local; measurements at one point of space can change the wavefunction at other points, even if these are far apart. Whenever a measurement is made, one of the possible values consistent with the probability distribution is obtained. The measurement somehow selects part of the wavefunction.

We are asking how this selection happens. Quantum mechanics is claimed to be a universal theory, applicable to everything, so it should apply to the apparatus used to do the measuring, and give us the answer to how the wavefunction reduces. The problem is that it tells us that the wavefunction cannot reduce!

Because we must include the apparatus in the complete description of the system, we now have a 'master' wavefunction which contains all the possible outcomes of the experiment. Each possible state of the original system is correctly correlated with the appropriate state of the apparatus, but all these outcomes are contained within the new master wavefunction, with a particular probability associated with each outcome for (system and apparatus). The wavefunction has not reduced.

It doesn't help if we look at the apparatus to see the result. This is the same as saying that we should measure the apparatus, and so the process just involves a new level, our eyes being the new measuring apparatus. The resulting wavefunction now contains information describing this apparatus.

QT, therefore, contains an internal contradiction when applied to individual systems. I cannot describe instruments suitable for, or capable of, making measurements. Given the enormous success of QT, we might try to modify it in such a way as to leave its predictions unchanged and yet allow reduction of the wavefunction in appropriate circumstances. However, there are formidable problems if this is attempted, and these have prompted consideration of alternative approaches.

Conscious observers and God

In spite of the point made above, we know that measurements occur. Although a microscopic instrument obeying the laws of QT does not reduce wavefunction, the latter are certainly reduced by the time the information reaches our brain.

Squires asks 'what is responsible for the reduction and what are the characteristics of 'instruments' that are able to cause it?', and answers that we do not know. He suggests that one possibility is that the reduction does not occur until we **know** it must; conscious observers are involved. He then tries to set out what consciousness is, freely confessing limited ability to do so comprehensively. However, he gives three possibilities as to what produces consciousness:

- 1) 'Complexity'; a system which is sufficiently large, with enough degrees of freedom and interconnections, might be conscious.
- 2) Something new, outside physics is needed. Some objects have it, some do not.
- 3) Perhaps everything is conscious, including e.g. stones and electrons.

From a Christian world-view, we would select 2); there is more to creation than just the physical or material. Option 1) is essentially reductionism, while option 3) opens the door to pantheism; neither of these is acceptable on biblical grounds.

So we have the possibility that external reality consists of a wavefunction, and that this wavefunction only reduces when an observation is made by a conscious observer. The act of observation actually changes the wavefunction. Squires comments on how outrageous this statement really is. It means that nothing ever really happens e.g. no particle decays, except through the intervention of a conscious mind. We are denying that the external world possesses the properties we observe, until we actually observe them — a picture that is hard to accept. The problem is illustrated by the paradoxes of 'Schrödinger's cat' and 'Wigner's friend', where the subjects exist in 'live/dead' states until conscious observation forces them into being either alive or dead.

It is here that QT might seem to offer possible roles for something that might be called god. One role is to make the choices that are required whenever a measurement is made that selects from a quantum system one of the possible outcomes. This god would be very active in all aspects of the world. The role would permit 'miracles'. e.g. according to QT, there is a small finite possibility that if I run into a wall, I will pass through it. A god could select this outcome if he so chose, however small the probability for my transmission through the wall.

Another role would be that the god is responsible for selective wavefunction reduction, knowing what observers intend to measure.

The comments of John Polkinghorne, professor of physics turned Anglican priest, are of interest here. He does not accept the latter role for God (2). He states that although God is the ground of being of all things (the guarantor of the Schrödinger equation), He is not an object among objects (not a collapse of the wavefunction).

These comments aside, the above approach still sounds too much like seeking to 'unify' scientific and theological language in a forced and artificial way, relying on verbal parallel. There may be some truth here; we cannot say definitely that this is **not** a description of one aspect of the activity of God in upholding the created order. Personally, however, I would be reluctant to accept this view as set out above.

Squires also puts forward the suggestion that conscious minds are connected, perhaps even universally, opening up mystical ideas of a collective-consciousness. Again this will not square with a biblical world-view. However, the shift from reductionist to holistic thinking may be helpful. Wave functions are very non-local objects; indeed this non-locality has been verified experimentally.

The many-worlds interpretation

One solution to the problem of wavefunction reduction is to say that it does not happen. This proposal was put forward by Everett in 1957.

Any isolated system can be described by a wavefunction that changes only as prescribed by the Schrödinger equation. If the system is observed by an external observer, then the observer must be incorporated into the system, forming a new system, with a new wavefunction determined for all times.



So far, we have said that this wavefunction reduces on being observed to one of the possible outcomes. But according to Everett, this does not occur. The true reality is always expressed by the full wavefunction containing the full number of terms. For two possible outcomes, there are two observers, both conscious but each unaware of the other. The world has split into two worlds, each containing one possible outcome of the observation.

The Everett interpretation required that all possible outcomes exist; whenever a measurement is made the world separates into a collection of worlds. The conscious minds split into several conscious minds, one for each possible branch.

The general view of the theoretical physics community has been to reject this interpretation (perhaps not surprisingly!). John Polkinghorne says it is enough to make William of Occam turn in his grave (entities are being multiplied with incredible profusion), and rightly states that reality is not to be trifled with and sliced up in this way. It hardly needs to be said that the idea of a multiplicity of worlds, some where I am already dead, some where my past history is vastly different from the one of which I am aware, is absurd. This idea illustrates the kind of thinking which develops when men 'do not think it worthwhile to retain the knowledge of God'.

Squires mentions the 'anthropic principle' with regard to the many worlds interpretation; we might live in the part of the wavefunction of the universe where life is possible. He has to offer possibilities such as this because he is reluctant to believe in design, finding it hard to see how everything could be just right when the universe began. He can find no convincing reasons to reject the many-worlds interpretation although it is counter to his intuition. Biblically, the revelation from God gives us true guidance in examining, and dismissing, this interpretation.

Hidden-variables

Quantum theory accepts a lack of determination. Knowledge of the initial wavefunction only permits probabilistic statements regarding the outcome of future experiments.

The removal of this randomness is the primary motivation behind the development of so-called 'hidden-variable' theories. Particles are taken to have precise positions etc. at all times; the wavefunction would not be the complete description of the system. A hidden-variable theory will tell us more than QT tells us. It must give the same results for those quantities which quantum theory can predict. There might be the possibility of solving the problem of wavefunction reduction.

Hidden variable theories are complicated and inelegant. We know the answers we need to arrive at from QT, and then construct a deterministic hidden-variable theory specifically to give these answers, introducing a **quantum force**.

In the approach of Bohm and de Broglie, the wavefunction plays the role of a 'pilot wave' which guides particles, which always have precise trajectories. The Schrödinger equation is solved to give the wavefunction at later times, a quantum force is calculated, and finally this force is added to the other forces acting on the particles and the paths are calculated using Newton's laws of motion. The quantum force is chosen to give complete agreement with the 'usual' predictions of QT.

The important advantage of this approach is that it is precise. No observers are required to collapse wavefunctions, since no such collapse is postulated. It was necessary in the above discussion because there the wavefunction was taken to be the complete description of the system. (We should note that the two approaches are experimentally indistinguishable. This is to do with the fact that that it is effectively impossible to obtain two macroscopic objects which are identical in all respects).

A theory which does not require collapse of the wavefunction would appear to have a real advantage ever since there is no positive evidence that this process actually happens. However, the general community of quantum physicists has been reluctant to accept hidden-variable theories, for the following sorts of reasons:

- 1) the elegance, simplicity and economy of QT contrasts sharply with the contrived nature of a hidden-variable theory which gives no new predictions in return for its increased complexity.
- 2) the picture of reality presented by the Bohm-de Broglie approach is very strange. The quantum force has to mimic the effects of interference, meaning that particles have to follow peculiar paths.
- 3) without wavefunction reduction, the situation is akin to the many-worlds interpretation. The wavefunction contains all possibilities. Here these are not realised, but they are present, nevertheless.
- 4) the Bohm-de Broglie theory is not compatible with special relativity. This is also true of ordinary quantum theory, but the problems for hidden-variable theories are more serious.
- 5) the quantum force is unlike any other force in physics, and acts regardless of distance.

We must now consider another aspect of the non-locality of QT.

Bell's theorem and non-locality

In 1935 Einstein and some colleagues published a paper which had, and still has, a great influence on the interpretation of QT. In the paper, they proposed a simple 'thought experiment' and followed through the implications of QT for the result of the experiment. These made explicit the essentially **non-local** nature of QT.

According to the authors, this proved that the theory must be incomplete; a more complete (hidden-variable) theory exists and might one day be discovered.

Some thirty years later the analysis was carried much further by the physicist John Bell, who showed that no **local** hidden-variable theory could reproduce all the predictions of QT. This was expressed in terms of mathematical inequalities, which are violated by the predictions of QT. This exposes the real nature of the conflict between 'common sense' and QT.

The world can either be in agreement with QT, or it can permit the existence of a local theory; both possibilities are not allowed.

Recent, difficult experiments by Aspect et. al. in France have confirmed the predictions of QT in this context. Its strange non-locality is not simply some defect of the theoretical framework. It is an experimental fact that mere spatial separation of quantum systems does not divide them from each other, even though that special separation may be very large. This is a very surprising result for physics, which is essentially a reductionist subject. The only way of avoiding ascribing this property to the world itself, and not just the quantum-mechanical description of it, is to adopt the many-worlds interpretation.

The Copenhagen interpretation

Four scientists played leading roles in the historical beginning of QT; Planck, Einstein, Schrödinger and de Broglie. The latter three in this group became, and remained, dissatisfied with the way the theory subsequently developed and with its accepted 'orthodoxy'. This orthodoxy is due primarily to three other major figures in the early development (Bohr, Heisenberg and Born) and has become known as the Copenhagen interpretation.

Depending on who is asked, accounts of this interpretation differ, but there are several key features which can be identified:—

- 1) Bohr used the idea of 'complementarity'. The particle and wave descriptions complement one another; one is suitable for one set of experiments, the other for different experiments. It does not make sense to ask whether they are consistent with each other. Each has its own domain of applicability.
- 2) The interpretation problems of QT depend on 'classical' ways of thinking, which should be abandoned; the problems will then go away. Questions which can only be asked using classical concepts are not permitted. Classical physics enters only through the 'correspondence principle', which says that the results of QT must agree with those of classical mechanics where the latter are valid.
- 3) The underlying philosophy is strongly anti-realist, as shown by this quote from Bohr:—
'There is no quantum world. There is only an abstract quantum physical description. It is wrong to think that the task of physics is to find out how nature is. Physics concerns what we can say about nature'.
- 4) Part of the creed was the existence of classical measuring instruments. This was before the universality of QT was appreciated. Somewhere along the line from the very small to the large, the result of the measurement gets fixed, and knowledge is established.

As Squires says, this is all very vague and answers few of the questions. This is not the place to examine why the Copenhagen interpretation did become the accepted orthodoxy. However, we can see from point 3) that it is supportive of a positivist philosophy (of science), which has been fashionable and influential in the twentieth century. The positivist approach would say e.g. that history is merely records in a library; whether there were real people and real events is a meaningless, unanswerable and irrelevant question.

Biblically we cannot accept this. We live in a real created world, with real people involved in real events. Because we have God's revelation in Scripture, we are not shut up to the groping of man-centred natural philosophy, where we cannot be sure that what we think is out there. As with the many-worlds interpretation, we see the kind of thinking that becomes necessary when God is ignored.

Summary

Because we can bring biblical criteria to some of the philosophy involved in the interpretation of QT, we should not pretend that we fully comprehend the message of the quantum world. If we are committed to belief in a real external reality, then non-locality shows us that this reality has elements which are far different from those of everyday life.

We do not understand what is going on when wavefunction reduction occurs, even though we can make measurements and predict the outcomes using QT. It may be that the sort of area which should be examined is to do with the emergence of classical measuring instruments from a quantum mechanical 'substrate'.

Some writers (3,4) have seen parallels with Eastern thought. John Polkinghorne comments helpfully that these (to him) rely too much on purely verbal features to be convincing. In (3), one reads of 'the end of science'. Perhaps this is not surprising when one considers that science would not have sprung from Eastern modes of thought and philosophy in the first place.

All solutions to the problems of interpretation require the wavefunction to exist; even hidden-variable theories do not eliminate this requirement. It seems that we must accept wavefunctions as real objects, and try to understand what they are and what is implied by their existence.

We have a deep conviction that things which exist do so at particular places. QT suggest that this is a limitation of our thinking, and also shows us that the tendency to divide things into the very small, limited in small regions of space, should be constrained. There are things that cannot be subdivided in this way; indeed the wavefunction is such a thing.

It should not surprise us that as we examine the microscopic world over ever more closely we find features which strike us as strange and mysterious. The ground of being of the created order is the Word of God's power, which is spiritual. It is not clear how to describe the interface between the spiritual and the physical, or how the microworld arises from its spiritual substrate.

We are not faces with the mystery of the bare existence of a world whose origin and purpose are unknown. The true mysteries are why its Creator has given it the features He has chosen to, as far as we can understand them through the discoveries of science, and why He should choose to involve Himself in its history and redemption.

References

- (1) 'The Mystery of the Quantum World', Euan Squires, Adam Hilger Ltd., (1986)
- (2) 'The Quantum World', John Polkinghorne, Longman (1984)
- (3) 'The Dancing Wu Li Masters', Gary Zukav, Fontana (1980)
- (4) 'The Tao of Physics', Fritjof Capra, Fontana (1976)

The Second European Creationist Congress

(Continued from page 5)

He proposed a Flood model, illustrated in detail by diagrams. Some of the crucial points were: without an imbalance in the Earth's crust, such as must have occurred with the eruption of all the fountains of the great deep (Gen. 7:11), there would have been no tectonic activity; and the 30 million or so years said to have elapsed during the 'Coal Age' dwindle down to mere weeks or months, once it is realised that floating forests cannot be buried except abruptly. All honest scientists must, in his view, admit the **catastrophic** origin of the fossil-bearing strata.

Geologist Micheal Garton of London lectured on the evidence from the last 3000 year's historical records for a major change in the tilt of the Earth's axis. This took place during the third millenium BC, and must have been a catastrophic event; some creationists link this with the Flood.

Dr. H. Murris, in his lecture, demonstrated that predators play only a very minor role in maintaining what is called the balance of nature; of a far greater importance are climate, micro-organisms and plants. The existence in nature of what, in mechanical systems, is called negative feedback, indicate purpose and design by an intelligent Creator. The Darwinian ideas of "nature, red in tooth and claw" and "survival of the fittest" are wrong, and out of date.

Dr. J.C. Whitcomb, with Henry Morris, co-authored 'The Genesis Flood', a landmark in creationist literature. His lecture 'Dinosaurs and Men' was a masterly exposition of the references to behemoth (Job 40) and Leviathan (Job 41; Psa. 104), supported by scientific evidence. The Biblical description of behemoth corresponds with the dinosaur called Diplodocus. The dinosaurs became extinct during the changed climate after the Flood; hence they were once contemporary with man. As Dr. Whitcomb said, to believe this is to invite scorn and ridicule from evolutionists, who claim that di-

nosaurus died out 70 million years before man appeared on Earth. He ended his talk by showing from Scripture and from natural history that we are living in a cursed and dying world, not an evolving one. Only those in Christ have any hope of survival.

The closing stages of the Congress were devoted to short reports of creationist activities in Europe and the USA. Gerald Duffet, a BCS member, made his mark at question with pertinent and thought-provoking comments.

The Congress was ably chaired by Dr. D. Rosevear (Chairman of the Creative Science Movement Council), who managed the lively question times with grace and tact. Each morning, before the lectures began, he had us on our feet, singing a hymn, and then reading portions of Scripture concerning different aspects of God's creation.

What did the Congress achieve? A lively exchange of views; a greater understanding of other Christians' thinking about creationism and related topics; and an awareness of possible dangers and fallacies in our attempts to defend the faith. And, not least, a drawing together in fellowship and acquaintance during informal talks at meal-times and coffee-breaks throughout the Congress.

All the lectures were recorded and are available on cassettes.

A shortened version of this report first appeared in the privately-circulated magazine, "Corn in Egypt", edited by P. R. Spacey, and this appears with kind permission.

Papers from the First European Creationist Congress, held in 1984, are contained in 'Concepts in Creationism', published by Evangelical Press. This book is reviewed in this issue of 'Origins'. — Ed.

Correspondence

We are grateful for a number of letters received since the first edition of 'Origins', and encouraged by the generally favourable reception. Such feedback is essential to the development of the magazine and to progress in the truth, and would therefore ask you to keep writing.

Letter from Michael Reiss, Hills Road Sixth Form College, Cambridge:

Dear Editor,

I greatly enjoyed reading the first issue of Origins and I wish it every success. One of the great strengths of its predecessor Biblical Creation was that while firmly tied to a creationist framework, its academic rigour refused to allow uncritical acceptance of every creationist argument. I hope that in that same spirit of intellectual integrity you will allow me to comment critically on the paper "The Statistical Improbability of Evolution" by B.A. Brady in Origins 1:1.

Brady's central point is that even the 4,000,000,000 years argued for by evolutionists is a totally inadequate length of time to account for the evolution of but one protein molecule, namely insulin.

I wish to make three criticisms of Brady's paper. These are arranged in ascending order of importance.

1. Brady states that point mutations to DNA occur at the rate of 1 in 10^{66} nucleotides replicated at the time of DNA replication. From Brady's subsequent argument I think this may be a misprint. The true value is nearer 1 in 10^5 .
2. Evolutionists believe that as many as 2,000,000,000 species may have evolved over the past 600,000,000 years. From these figures Brady concludes: "That means that an entirely new living species is supposed to have appeared (evolved) on average every 4 months of the year over the past 600 million years. Just think of it. A complete living thing evolving in just 4 months! Such is the faith of the evolutionist!"

This is seriously to misunderstand the evolutionist's position. Evolutionists believe that it took a long time, possibly several hundred million years, for the first species to evolve. Thereafter it

takes typically of the order of one million years for each new species to evolve from its immediate ancestor, though the rate varies hugely from some groups where new species are thought from the fossil record to arise perhaps only once every hundred million years or so to groups where new species arise within perhaps as little as ten thousand years.

3. Brady argues that as there are 20 different biological amino acids that go into making proteins, given that insulin is a protein with 51 amino acids, the chance formation of the insulin molecule can be no better than 1 in 20^{51} or 1 in 2.2×10^{66} . This is to misunderstand the way in which natural selection works. First, natural selection does not have as its goal a single order of amino acids. Indeed the fact that the insulin of different species of vertebrates differs in its sequence of amino acids shows that this is not the case. Secondly, natural selection works by improving what already exists. Out of, say, a million randomly generated proteins, perhaps only a few will have the insulin-like property of depressing blood sugar levels. Natural selection works by eliminating organisms less well adapted to their environment. In this case if control of blood sugar level allowed an organism to survive and reproduce better, natural selection would favour the first organisms with proteins that had this ability. By comparison with insulin as we know it, such a protein might confer on the organism possessing it only a slight benefit. However, random mutations in the order of the amino acids of this protein, while usually leading to less beneficial proteins, which would subsequently be eliminated by natural selection, would occasionally throw up proteins with a greater effect on blood sugar levels. Over the several hundred million years that evolutionists believe vertebrates to have existed, natural selection could gradually give rise to the evolution of a hormone with all the subtlety and precision of effects that insulin has today.

B. A. Brady replies as follows to each point:

1. Yes, 1 in 10^{66} was a misprint. The value I gave was 1 to 10^{11} .
2. Since evolutionists believe that it takes typically one million years for one species to change into another, the alternative to saying that one new species appeared (gradually) every 4 months, is to say that 3,333,333 new species appeared (explosively) every one million years, as is supposed to have happened in the enigmatic 'Cambrian Explosion'. I do not think that this is a much better alternative for the evolutionist.
3. It is true that there are different sequences of 51 amino acids in the insulin of some vertebrates. Human insulin differs from pork insulin by one amino acid and from ox insulin by 3 amino acids. These facts prove nothing about evolution or natural selection, or prove that almost any sequence of amino acids will function like insulin in depressing

blood sugar levels; on the contrary the facts prove otherwise. We cannot say that a few proteins out of every million randomly generated will have insulin-like properties; this would be tantamount to saying that about 20^{46} out of 20^{51} possible chains will serve as insulin. Only a handful have proved to be insulin, which leaves the central point of my article unaffected.

Natural selection does not work by improving what already exists, natural selection improves nothing. It does not even 'select', but only eliminates and rejects. Any 'improvement' in an amino acid sequence through random mutations is solely the work of chance. In any case how could insulin evolve? Without insulin the first vertebrate would not survive 2 years.



Extract from a letter from Frank J. Peachey, Sudbury:

In the article 'Computers and Creation' you say that the Bible tells us that man **has** a soul (my emphasis). This is incorrect; the Bible nowhere states that man has or possesses a non-material soul. The unambiguous testimony of the whole of Scripture (on this subject) is that man **is** a soul. It really does little justice to the scriptural usage of **nephesh**, **ruach**, **psyche**, and **pneuma**, to make such an unqualified statement about the nature of man.

Editors comments:

We agree in principle, without going into the questions raised by Heb. 4.12. The unique nature of man is indeed a vital part of the creation narrative, and foundational to our understanding of ourselves. We would be pleased to receive contributions which work out the consequences of this truth.

Mr. Peachey was one of the few BCS members whose letters have been published in the media as part of the ongoing public debate referred to in 'Creation in the News', Origins 1:1. We would encourage other members to follow this example in challenging evolutionary assumptions wherever they occur.



News of Creation

Creation Meetings

Sadly, John Mackay was not able to address the meetings referred to in our previous issue; but they did in fact take place, with BCS speakers. Another regional conference is planned in Essex later in the year, on October 10th 1987 in Chingford; and a further one at Cornerstone Baptist Church, Bromley Cross, Bolton, on October 17th. Details on 0204 382609.

Also on October 17th the Creation Science Movement are holding a one-day seminar on basic scientific evidence supporting creation at Westminster Chapel, Buckingham Gate, London. Beginners in Creation Science are particularly welcome. Further details 01 460 7503.

Creation Correspondence Course

Named after a respected Australian creationist of former years, the Joseph Shelley Institute is offering by correspondence a Certificate Course in Biblical Foundations, which is essentially concerned with creation in all its aspects. This course has been in existence in Australia and other countries for some years, and details can now be obtained in the U.K. from P.O. Box 9, Penarth, South Glamorgan CF6 4YN. The BCS shares the view of the Institute that the message of creation is for sharing; it is vital to the spiritual health of all believers.

Earlier this year Arthur A. Johns M.A., the Administrator of the Course, was in the U.K. to meet a number of creationists. We intend to publish a short interview with him in the next edition of 'Origins'.



Book Review

Darwin's Enigma: fossils and other problems.

Author: Luther D. Sunderland.

Publisher: Master Book Publishers, San Diego, California. 1984.

Reviewed by David J. Tyler.

The background to this unusual book is a decision made in December 1978 of the New York State Board of Regents. Because of the intense interest in the subject of origins in the USA, the State Board directed the New York State Education Department to carry out a detailed study of how theories of origins should be treated in a revised version of the State's Regents Biology Syllabus. Luther Sunderland was invited to supply information to the Bureau of Science Education which was conducting the study.

So it was that during the next year, the author conducted taped interviews with officials in some of the world's most famous natural history museums. The interviews were with Colin Patterson, Niles Eldredge, David Raup, David Pilbeam and Donald Fisher — names which are likely to be familiar to students of origins.

Sunderland's approach was to question these palaeontologists about the evidence the fossil record contributes to the study of origins. Typed manuscripts of the interviews were then submitted to the interviewees for editing. The final document is filed in the USA as Microfiche ED 228 056 "Darwin's Enigma: the Fossil Record", available through the US public library service. This book owes its existence to these interviews, and Sunderland quotes extensively from the transcripts as he develops his



argument that the majority of school textbooks "are completely devoid of certain very significant scientific information which is talked about behind closed doors but not made available to the public." (p.12). This information shows that the fossil record does not substantiate the idea of a progressive development of life from a common ancestor.

"The paradox is that the Achilles' heel of evolution theory turned out to be the very problem which troubled Darwin the most, namely, the lack of any fossil evidence to support the supposition that all life had come from a common ancestor. Indeed, although Darwin fervently hoped that further geological exploration would vindicate his theory, the fossil record has become Darwin's Enigma." (p.22)

Readers of this book should not expect a definitive discussion of data. Sunderland is unashamedly reporting the views of a number of eminent palaeontologists because he is convinced that their opinions should carry some weight with educationalists and other interested parties. We read their comments on the major postulated evolutionary developments: invertebrates to vertebrates, fish to amphibians, amphibians to reptiles, reptiles to birds (with a very full discussion of *Archaeopteryx*), reptiles to mammals and the origin of various mammalian orders. Sunderland draws on the published work of others to expand on certain topics of interest — particularly on non-palaeontological subjects like the origin of the living cell, population genetics, and the improbability of neo Darwinism.

In one significant paragraph, Sunderland reports on the interview he had with Colin Patterson of the British (Natural History) and author of a book on evolution.

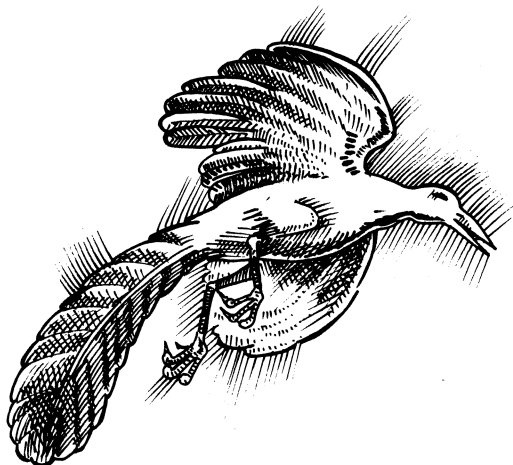
"Throughout the interview he denied having transitional fossil candidates for each specific gap between the major different groups. He said that there are kinds of change in forms taken in isolation but there are none of these sequences that people like to build up. Putting it as a question, he said, 'If you ask, 'What is the evidence for continuity?' you would have to say, 'There isn't any in the fossils of animals and man. The connection between them is in the mind.'" (p.90)

The whole book may be summarised by describing it as an extended elaboration of this assertion and, as such, it is worthy of a wide readership.

Sunderland writes as an interested observer of the contemporary origins debate, and as one who is alarmed by the resistance of educationalists to any suggestion that the fossil record does not substantiate ideas of progressive development.

"The information presented in this book is not now readily available to public school, college and university students, but it should be presented for open discussion along with a host of material that is now supplied in support of evolution theory." (p.153)

In the reviewer's opinion, Sunderland's book makes a significant contribution to available literature, and is suitable for giving to teachers, students and anyone else with more than a passing interest in the meaning of fossils.



Concepts in Creationism

Edited by E. H. Andrews, W. Gitt and W. J. Ouweneel
Evangelical Press, 1986. 266 pp. £6.95

Reviewed by David Watts

This publication is in the form of an symposium resulting from the first European Creationist conference. This reviewer regrets further currency being given to the 'Creationism and Creationist'. Admittedly, however, there do not appear to be succinct alternatives and Andrews' discussion on p.46 is most helpful.

Creationist symposia, published with this quality of external presentation, have hitherto largely been a North American phenomenon. Amongst the ten (all male!) contributors only one has transatlantic affiliations — and then from Baltimore, Maryland rather than the heartlands of the Bible Belt. The remaining contributors com-

prise four from Britain and five from continental Europe. Not only is the standard of presentation extremely high but the editorial work has been executed with considerable attention to detail. 'Secular' counterparts to this kind of conference volume are commonly notorious for a high error frequency. Again the clarity and English style is very good for a technical volume and even remarkable considering the multi-national authorship. The figures, which are fairly numerous, have all been printed well and these, together with photographs, considerably enhance the text.

At the outset there are brief pen-pictures, plus photographs, of the authors. Without exception they are very well qualified academically. However, in view of the range and complexity of the issues discussed we should judge each contribution primarily by its intrinsic coherence and scientific and exegetical integrity.

What is the purpose of this volume? In the narrow sense it is not a straightforward defence of creation as a theory of origins. It is rather an articulation of thought within the framework of biblical creation — that is, that the Universe we find ourselves part of is the handiwork of the personal God of the Bible and that (negatively) we are not the products of impersonal Chance or Necessity. Such an exercise, however, does have a broader apologetic function. It partakes in the outlook of, for example, Abraham Kuyper who asserted that the Christian community should not assume a defensive stance; it should busy itself with bringing to fruition the meaning of its principles in every sphere of life — in the church, the state, the family, the school, the business establishment, etc. Consequently, there is a pervasive unity to this volume, despite the diversity of topics addressed. It is a worthy piece of Christian scholarship which serves as a benchmark for the future.

The ten individual contributions are grouped into three parts:

I. Biblical Concepts, II. Evolution and Man and III. Scientific concepts. Several of these provide important overviews of major aspects of creation-faith. Thus, E. H. Andrews compares biblical and scientific creationism, a topic also discussed in the forward by Walter Lang. Andrews adopts a broad definition of 'creationism' — being wider than Christianity and including even agnostic creationists. However, D. T. Rosevear implicitly assumes a very narrow definition (p.68): 'Creationists claim that there is good scientific evidence for a young earth'. This seems to exclude the present reviewer who would not make such a claim. However this appears increasingly to be the understanding of this term, especially in the USA. As such it is most regrettable. Many evangelical scientists who are not 'evolutionists' are having to say that they are not 'creationists' either by this narrow definition, despite their firm commitment to creation, the Creator and his word. Professor Andrews adds the qualifiers 'scientific' or 'biblical' to 'creationism' and then proceeds to show that this makes a substantial difference. I have heard that he has been misunderstood in his critique of scientific creationism. He is surely not opposed to scientific critiques of, for example, chemical evolution(ism). But he is not content merely to see evolutionary speculation demolished. He wants a constructive, Christ-centred world-view in its place.

The chapter by co-editor Werner Gitt contains a fresh and stimulating approach to Creation. This utilizes Venn diagrams to clarify biblical ontology (ie. 'What are the categories of reality?') and proceeds to consider the matrix of possible interactions between the Bible and science relative to those domains which either are, or are not the subject of special divine revelation. This is a most valuable type of exercise. In one sense it is introductory to W. J. Ouweeneel's discussion of anthropology which utilizes the insights of the Amsterdam (Christian) philosophy concerning the hierarchical ordering of the creation. (Some years ago V. S. Poythress published an excellent treatise on similar lines which appears to have been neglected.) The second section of W. Gitt's chapter considers the design engineering implicit in the phenomenon of bird migration. There are some quite astounding details given, but it would be incorrect to talk of the 'miracle' of bird migration once these creatures are already existent.

The third article in the 'biblical concepts' section is on the genealogies in scripture. Dr. Rosevear provides a concise discussion and argues towards the view that the primaevial genealogies of Genesis 5 are complete. This

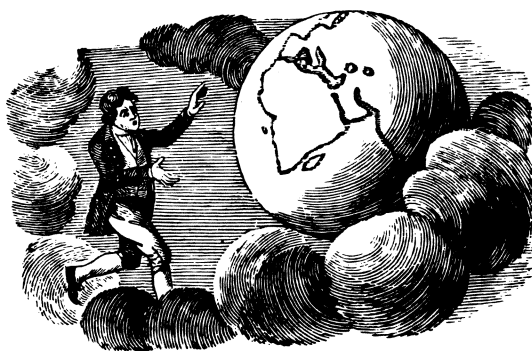
was not the conclusion of H.M. Morris and J.C. Whitcomb and I remain convinced that their more cautious position is preferable. Nevertheless there is much to ponder here although more could have been said about the interpretation of the genealogy in Luke 3.

Numerous articles have been published by Christians attempting to describe the 'knock on' effects of evolutionism and unfortunately a great many of them go way over the top and lose credibility. The chapter by D. W. Cheek on 'The impact of evolution on historiography' is a refreshing exception. Both this article and its bibliography are excellent. Following this in the 'humanities' section is G. H. Duffet's chapter on 'Human origins and the Olduvai finds'. This, of course, relates to the hominid finds by Dr Leakey and colleagues in Africa. Here we have a lucid technical description of the finds, illustrated by appropriate maps, diagrams and tables. Such is the diversified nature of these remains that a coherent picture is difficult to grasp. The final summary is probably the most economic way to conclude at present. Certainly we are indebted to the author for his painstaking analysis to which we shall return whenever new finds are reported!

The last four articles are grouped as part III: Scientific Concepts. These are all 'biological' in content or focus. First there is a very competent chapter by H. R. Murriss on 'The concept of a species and its formation'. Next, the information scientist E. Bertsch is at the theoretical level discussing the possibilities and limitations of improvement by random changes to textual data. Logically, the next article would be that by C. Darnborough with the provocative title 'Genes': Created but Evolving'. It is worth the price of the book to secure this chapter alone. Darnborough does two things. First, he integrates his understanding of molecular genetics into a biblical world-view. Then he also presents a contemporary summary of this area of science which is pitched at just the right level.

The paper by S. Scherer is also most impressive. He begins with the argument: 'Creationism is not a science'. Then he proceeds to consider the usefulness or otherwise of the concept of a 'basic type' (kind). His conclusion is well worth quoting as it epitomizes the thrust of this volume as a whole.

"Let us keep in mind that it is easy to set up great unifying hypotheses. The difficulties will arise in supporting these hypotheses with detailed studies in specialized fields, representing thorough and solid work. This work (who knows?) may significantly weaken our most cherished hypotheses. Perhaps the concept of basic types will eventually prove not to be of value in biology. Be that as it may, creationists should do such work. Otherwise they will contribute nothing of use to biology."



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